

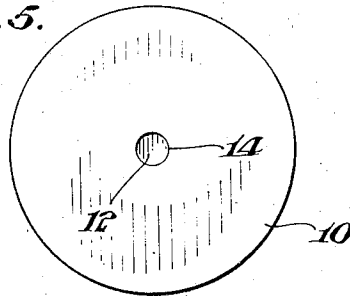
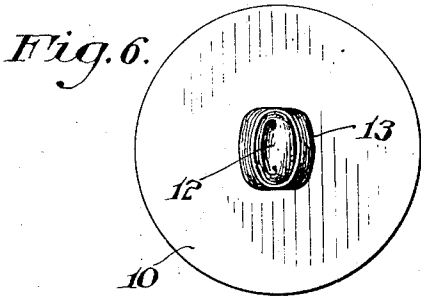
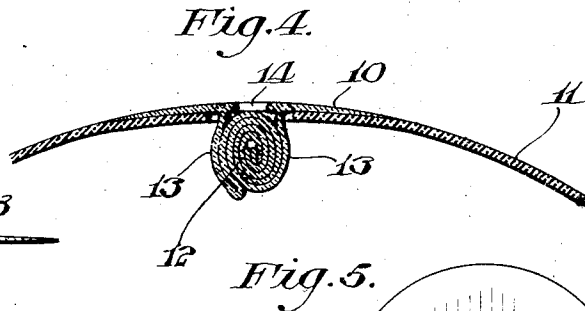
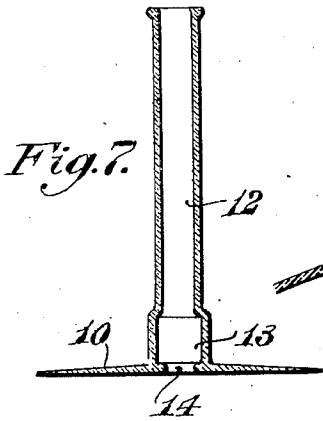
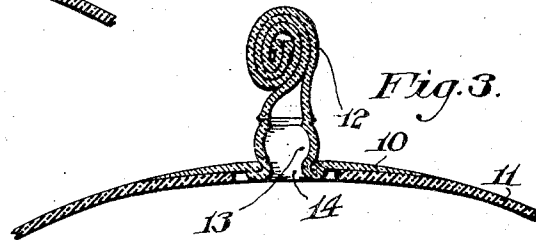
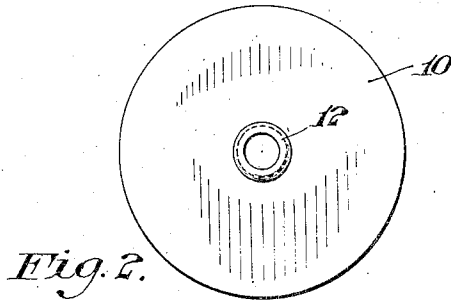
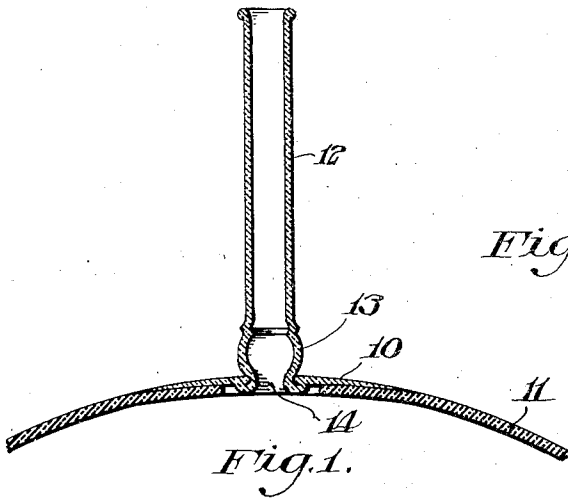
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E. E. TOMPKINS

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VALVES FOR PNEUMATIC DEVICES

Filed July 2, 1930



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UNITED STATES PATENT OFFICE

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VALVE FOR PNEUMATIC DEVICES

Application filed July 2, 1930. Serial No. 465,372.

My invention relates to a valve for pneumatic devices such as play balls, air cushions, life preservers, and other devices made of rubber or the like, which may be inflated and deflated at the will of the user.

The principal object of my present invention is to provide a simple and relatively inexpensive form of valve for inflatable devices.

A further object of my invention is to provide a valve which may be quickly and easily brought to the sealing condition, and which when so arranged will effectively prevent the escape of air from the interior of the device to which it is attached.

A further object of my invention is to provide a valve which will be characterized by the absence of protruding parts, when the device to which it is attached is inflated.

My invention will be more readily understood from the following description, taken in connection with the accompanying drawing forming part hereof, in which:

Figure 1 is a vertical central section of a valve embodying the main features of my present invention, the same being shown in connection with a portion of the device to which it is attached, which may be, for example, a play ball;

Fig. 2 is a top or plan view thereof;

Fig. 3 is a view similar to Fig. 1, but with the valve shown in the intermediate condition, for the purpose of illustrating the manner of closing the same;

Fig. 4 is a view similar to Fig. 1, but with the valve shown in the closed or sealing condition;

Fig. 5 is a top or plan view of the valve in the condition shown in Fig. 4;

Fig. 6 is an underneath plan thereof; and

Fig. 7 is a vertical central sectional view, showing the preferred form of the valve as it is initially molded.

It will, of course, be understood that the drawing and description herein contained are illustrative merely, and that various modifications and changes may be made in the structure disclosed without departing from the spirit of my invention.

The valve device is preferably made of

soft rubber, and comprises a disk portion 10, which is secured by cementing or vulcanizing to the outside of the pneumatic device 11, in connection with which the valve is used. The disk portion 10 tapers to a thin edge, thereby obviating any ridge or shoulder at its periphery.

Extending from the disk portion 10 is a tube 12. The portion of the tube 12 near the base thereof constitutes an envelope for the remaining portion of the tube when the same is in the closed condition, as will be hereinafter more fully described.

The preferred form of the valve as it is initially molded is shown in Fig. 7 of the drawing. It will be noted that the envelope portion 13 may be somewhat larger in diameter than the main portion 12 thereof, and also somewhat larger in diameter than the constricted opening 14 of the disk 10. Before the valve is secured to the pneumatic device in connection with which it is to be used, the tube portion 12, including the envelope portion 13 thereof, is pushed through the constricted opening 14 of the disk 10 and turned inside out, whereby the same assumes the shape shown in Fig. 1 of the drawing.

In the use of the device, the article to which the same is attached is inflated by having air blown through the tube 12 of the valve. The lower portion of the tube is then temporarily squeezed, and the upper portion is rolled upon itself, starting from the outer end, until it reaches the position shown in Fig. 3 of the drawing.

The rolled up portion of the tube 12 is now pushed inwardly through the constricted aperture 14 in the disk portion 10, reversing the envelope portion 13 of the tube to the position in which it was originally formed, so that the same extends inwardly with respect to the disk portion 10. The rolled up portion of the tube will then be enclosed and tightly held by the envelope portion 13, as shown in Figs. 4, 5 and 6 of the drawing.

The envelope portion 13 of the tube will be stretched when the main portion of the tube is rolled up within the same as shown in Figs. 4, 5 and 6 of the drawing, thereby holding said rolled up portion with sufficient

tension to prevent the escape of air from the interior of the device to which the valve is attached.

5 When it is desired to deflate the device, the same is so manipulated by the user that the rolled up portion of the tube and its enclosing envelope are pushed outwardly through the constricted opening 14 at the center of the tube portion 10, after which the pressure of
10 the air from the interior of the device will cause the tube 12 to be unrolled. The air will then be permitted to escape through the tube 12.

15 It will be noted, however, that in order to bring the tube to the condition to deflate the device, a peculiar manipulation of the rolled up tube and its enclosing envelope will be required, and that it will be virtually impossible for the tube to be accidentally
20 brought to the deflating condition.

25 It will also be noted that the valve in its closed or sealing condition is characterized by the absence of protruding parts, such as flap laces and the like, which are very objectionable in connection with valves for play balls, and are equally objectionable and uncomfortable when the valve is used for air pillows and similar devices.

30 It will further be noted that the pressure existing within the device to which the valve is attached will tend to maintain the seal in proportion to the amount of pressure existing.

35 The valve is inexpensive in its construction, and has been found to be very practical for its intended purpose.

I claim:

1. A valve for pneumatic devices, said valve being made entirely of flexible material and comprising a disk portion permanently secured to the device in connection with which the valve is used, a tube extending from said disk having a portion of a length whereby the same may be rolled upon
45 itself to form a seal, said tube also having a structurally defined envelope portion adjacent the disk portion, said disk portion having a constricted aperture through which the rolled up portion of the tube is adapted to
50 be pushed whereby the envelope may be reversed to extend entirely into the device and to hold the rolled up portion of the tube therein and thereby maintain the seal.

2. An inflatable article having a tube through which the same may be inflated said tube being of flexible material having a portion of a length whereby the same may be rolled upon itself to form a seal, and said tube having a structurally defined envelope
60 portion adjacent the surface of the article, said envelope portion with the rolled up portion contained therein being disposed inwardly of the article when the tube is in the sealing position, and the article having a
65 constricted opening through which the enve-

lope portion with the rolled up portion contained therein is pushed to the sealing position.

3. An inflatable article having a tube through which the same may be inflated, said tube being of flexible material and having a portion of a length whereby the same may be rolled upon itself to form a seal, a portion of said tube adjacent the surface of the article being adapted to receive and contain
75 the rolled up portion thereby to maintain the seal, and the article having a constricted opening through which the tube is pushed to the sealing position.

In testimony whereof, I have hereunto
80 signed my name.

ERNEST E. TOMPKINS.

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